Bridging the Gap: Translating Livestock Research Knowledge into Action for Sustainable Development - Report of a Workshop, Nairobi, 16-17 November 2006

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Background and context

The workshop arose following a series of meetings and discussions with Bill Clark and Nancy Dickson of the Kennedy School of Governance, Harvard University – Robin meeting them in 2005, Shirley in early 2006 and deciding to explore how to work together given potential interests and synergies in the area of knowledge management and use for sustainable development. The subsequent phone and email discussions involving Robin, Patti, Dannie and Shirley (Ranjitha, Tom and Julius joined for one telecom) from ILRI to identify appropriate workshop goals, participants, timing and projects. The workshop was funded using a combination of funds from the Harvard group and T5 USAID linkage funds.

In identifying the workshop focus, we needed to choose between a narrow focus on boundary partners, or a broader set of issues on knowledge to action, using a case study format that would give us a reasonable number of people who have been directly working on such issues in a diverse set of environments, and then use a cross cutting approach to identify common issues and questions to explore further. Having chosen the latter approach, we then needed to identify the appropriate projects and participants. From a long list of 8 projects, we selected 4 that we felt could be the richest and that had been on going for some time (and therefore presented the opportunity to reflect on what had been learnt and not what we hoped might happen in the future!). The projects chosen were:

Fodder innovations for small holders in India
(Prasad Vishnubhotla, Dannie Romney)

Reto-o-Reto project: Better policy and management options for pastoral lands
(Robin Reid, Mohamed Said, Dickson Kaelo, Ogeli Makui)

Poverty mapping (Patti Kristjanson, Julius Nyangaga, Paul Okwi)

Preventing and containing trypanocide resistance in the cotton zone of West Africa
(Tom Randolph, Delia Grace, Hippolyte Affognon)

Ranjitha (from the project Improving Productivity and Market Success of Ethiopian Farmers) participated, but did not present a case study because the project is relatively new.

Workshop format

The workshop was structured so that following an overview presentation by Bill, each of the four teams presented a case study – using a number of questions provided by the Harvard team and based on their previous experience from diverse projects. Each case study was discussed and then participants all contributed ideas on what they saw as the main cross cutting issues that would warrant further discussion. These were clustered into two main groups and each of these then discussed further. The workshop concluded with identifying next steps, and concretizing a number of these for short term action. In summary, the workshop aimed to:

1) Familiarize workshop participants with the teams and projects that participants have experience working with;
2) Discuss what makes some teams/projects work better than others in linking knowledge with action; and
3) Explore some characteristics of successful teams/projects.

Workshop program

1. Overview of Knowledge Systems for Sustainable Development
2. Case study presentations and discussions
3. Identification and discussion of cross cutting issues
4. Next steps

1 Knowledge Systems for Sustainable Development: Mobilizing R&D for decision making

Bill Clark gave an overview of the Knowledge Systems for Sustainable Development project which is a broad, multi-institutional effort to improve human well-being. We hear dissatisfaction from researchers that much of what is known is not getting into practice. The practitioner community complains that it is not getting the focused attention of the science, technology and innovation communities. The goal of the KSSD project is to map the gap between knowledge and action and explain why that gap persists. We begin by focusing on the relatively small number of cases where the gap has been substantially closed. This has included reviewing the innovation systems literature. Comparative analysis allows us to look across sectors (e.g., agriculture, public health, computer hardware technology, manufacturing (green chemistry), military R&D) to match the needs of decision makers with technology and knowledge needed to narrow the gap.

Our research looks at whether there is any set of general guidelines or rules of thumb that we can use to learn from so that everyone doesn't have to make the same mistakes. We begin by looking at the following, which were also used as a framework for the case study presentations:

1. Problem definition/need to support user-producer interactions
2. Research management/ Study issues but solve problems
3. Program organization/ Fostering boundary spanning activities
4. Decision-support systems/Systems perspective
5. Learning orientation/Safe places
6 Continuity and flexibility/Adaptive management
7. Asymmetry of power

1.1 Problem definition/Need to support user-producer interactions

What is the problem to be solved by your research? How – if at all – did the development of the research provide for a user-driven dialogue between scientists and decision makers to shape problem definition? How -- if at all -- did the ultimate problem definition differ from initial formulation by scientists and decision makers, respectively?

"Users" were defined as requiring a "resource allocation." These are people whose beliefs, behaviors, convictions, and/or resources need to be changed. How can we map who those users are and figure out how to engage them? In the process of problem definition the problem will frequently get reframed. Researchers discover that their research is irrelevant and "use a hammer to solve a problem." This effort encourages researchers to consider other ways to solve problems. Sometimes problems have to do with power and there's not much that a scientist can do to solve the problem.

Bringing science to bear on a problem may require that scientists take a more activist role so that we're not just increasing the power differentials, e.g., moving from being information providers to scientists entering the process and being active participants in the negotiation process. This acknowledges that conventional science can unintentionally devalue other kinds of knowledge.

1.2 Research management/Study issues but solve problems

Was your research developed in such a "project" mode? Did it have specific, measurable goals and targets? If so, what? To what extent and in what ways was goal and target definition driven by scientists or decision makers, or both? To what extent and in what ways were research leaders held accountable for achieving those goals and targets?

Where does science study problems rather than solve them? We need to assess the factors that affect the vulnerability of particular places. Curiosity-driven research is not sufficient to connect knowledge with action. Reframing an issue to solve a particular problem for a particular user or group of users is important. This makes scientists accountable to the users and allows scientists to build capacity to answer other questions in the future.

Are there alternative sources of basic research to that provided by the CG centers? What the CG centers can uniquely contribute is collaborative, use-driven fundamental research in which engagement of the community is key to the research agenda.

1.3 Program organization/fostering boundary spanning activities

Did your research involve a boundary spanning function or organization? If not, how did you organize the dialogue between producers and users of research knowledge? If so, where and how was the boundary organization or function created? What did it do? To what extent was it accountable to both users and producers for achieving its goals?

Conducting solution-oriented research with people in the user community doesn't happen by accident. It takes time and effort to get access to the user community. This work creates a brokering function to do the boundary-spanning work that is at the center of successful work. Brokering the dialogue is not the same as what a communication officer does. Boundary spanners are neither captured by the decisionmakers nor are they science-advocates for the community they work in. Boundary spanners are part of institutions that build accountability systems that credit this work. Boundary spanning work and institutions and processes that support it can structure reward and incentive systems differently and build skills in how to do it better.

ILRI is a learning organization. What is needed are incentives and rewards for researchers. Work plans need to acknowledge not just publications, but also communication. Clarification about the criteria by which employees are evaluated is needed.

Boundary work operates between two or more groups that work to different standards and objectives (e.g., basic scientists evaluated by peers v. action people who are validated by a political process). Boundary objects are joint creations at the interface of communities (e.g., models, maps, assessments, contracts, posters).

1.4 The decision-support system/ Systems perspective

To what extent is the decision support system developed by your program an end-to-end system? What are its discrete elements (e.g., a weather forecast; an impact model converting climate forecasts into yield forecasts required by decision makers; a discussion roundtable' or 'feedback workshops')? Which were the hardest elements to put in place? Why? What changes in research, decision-making, or both have occurred as a result of the system?

Many efforts to link knowledge with action collapse because they locate their activities only in one part of the knowledge to action or research to development continuum. They neglect links in the hope that someone else will provide those links. Very often, especially where there is public goods production where there isn't firm demand many good ideas die in the "Valley of Death" e.g., in energy innovations there is a gap between funding demonstration projects and getting the innovation into the field. CG incentives tell you "get impact" while the other part of the system tell you to keep focused on the "front end of the chain" and you'll get in trouble if you scale-up. There is a fundamental contradiction between these two assertions. The challenge is where, by suitable pairing of partners, can you get specialization and have conviction that the partner will deliver the goods. In CG there is a triple jeopardy because of the early success in the Green Revolution when there was significant investment in NARS and the extension system. In the commodities area there was immediate success. There is an assumption that this would happen in non-commodities as well.

How can we read the signs of the Valley of Death? Perhaps there is a need for an outside advisory group of people who aren't vested. Other professional communities, e.g., diplomatic and military corps, have taught contextualized story-telling.

1.5 Learning orientation/Safe places
Did your research have an expressly experimental orientation? How did it identify which risks to take? How did it identify success and failure? How did it engage outside evaluators to help it reflect on its own experience? What are the most important lessons you have learned regarding pitfalls to be avoided, or approaches to be followed in the future?

Providing safe places to experiment is difficult for management. Those who do something different will overtly be trying to change the power imbalance which can be unpopular. We have found organizational creativity in groups that experiment and push the limits, e.g., in the USA the Office of Naval Research.

How can managers encourage risk taking? It's difficult to institute learning because the essence of success is something that we can't talk publicly about. We recognize that a substantial number of projects should fail or irritate management. High tech R&D firms use a 70% failure rate to demonstrate that they are taking enough risks. Management needs support from independent review groups to advise what the appropriate rate of failure should be. Daring to make mistakes and learning from them rather than burying them is something that requires learning, e.g., surgeons are taught the difference between carelessness versus proceeding given a probability of success.

1.6 Continuity and flexibility/adaptive management
How do budgetary requirements and/or human resource pressures influence your program? What, if any, collaborative funding mechanisms have you developed to ensure continuity and relevance to users' needs? If applicable, how do you maintain public funding, or incorporate private funding for the provision of a partially private good? What, if any, innovative approaches have you developed for enhancing human capacity in your program area (e.g. providing incentives to reward interdisciplinary activities or training in team building / facilitation)? How does this translate into the characters you look for in people who you recruit to join your team?

Building social trust needs continuity of a decade or more before one sees a change in attitudes and behaviors. How do we keep functional continuity/stability and flexibility? Unfortunately we don't have solutions to offer.

2 Project Presentations

Project case studies and presentations are available at: cgspace.cgiar.org/handle/10568/548

- Fodder innovations for small holders in India (Prasad Vishnubhotla, Dannie Romney)
- Reto-o-Reto project: Better policy and management options for pastoral lands (Robin Reid, Mohamed Said, Dickson Kaelo, Ogeli Makui)
- Poverty mapping (Patti Kristjanson, Julius Nyangaga, Paul Okwi)
- Preventing and containing trypanocide resistance in the cotton zone of West Africa (Tom Randolph, Delia Grace, Hippolyte Affognon)

3 Cross-Cutting Issues

Participants submitted candidate cross-cutting topics for discussion (verbatim list of these is on website); these were then clustered around two main issues which were further discussed. The two areas were: 1) Linking knowledge with action as a systems perspective; and 2) Boundary work/scaling-up results.

3.1 Linking knowledge with action as a systems perspective

This topic covered a cluster of candidate topics that included:
1. Tensions between research and development
   - Advocacy v. fair broker v. comparative advantage of research institutions
   - Co-production of knowledge/Mode 2 science[1]
   - CG tension (Science Council v. donors)
   - Analysis of causes v. report on state of the environment
   - Issue cycle/stages
2. Relation to outcome mapping
3. Self-assembly v. comprehensive view
4. Farmers as experts and actors
5. Policy relevant knowledge

Bill Clark presented slides on linking knowledge with action (see website) Box 1 has a narrative summary of the message around the slides.

Box 1. Linking knowledge to action – narrative summary.
Successful programs for linking knowledge with action require thinking in terms of end-to-end, integrated systems that connect basic scientific predictions or observations through several steps to outputs directly relevant for decision making, rather than hoping all the pieces will come together. For example, the International Agricultural Research System learned there was a need to foster national research capacity and facilitated extension services linked to International Agriculture Research Centers (IARCs). There is a need to forge "supply chain" perspectives on the design of systems that assure no missing or mismatched links between creation and ultimate use of knowledge.

The Research-Development continuum is a false dichotomy and 25 years out of date. We need to move beyond basic v. applied research to think about use-inspired basic research or fundamental research. What knowledge would be needed to integrate disciplinary knowledge? The ILRI Science Council should recognize that research in "Pasteur's quadrant" is real research. It gets its vitality from being precisely in the middle of those two worlds. This is why the global public goods argument is relevant.

The "Dynamics of Sustainability Science" figure shows that little progress is made by moving from current knowledge to inventing a technology as if you weren't working through existing knowledge. Sustainability science is science harnessed for environment and development. It is engaged science responding to real problems.

Discussion focused around the following topics:

The importance of recognizing the space one is located in on the knowledge-action continuum and need to be aware of the tension from the start.

The innovation systems approach is not uni-directional, it is an iterative process that incorporates feedback.

There is a need for an agreed upon vocabulary to give this research legitimacy and to foster dialogue with those unfamiliar with some of the terms.

[1] Mode 2 science was referred to by ILRI Director Carlos Seré, "The old paradigm of scientific discovery ('Mode 1') characterized by the hegemony of disciplinary science, with its strong sense of an internal hierarchy between the disciplines and driven by the autonomy of scientists and their host institutions, the universities, [is] being superseded—although not replaced—by a new paradigm of knowledge production ('Mode 2') which [is] socially distributed, application-oriented, trans-disciplinary and subject to multiple accountabilities." (Nowotny, Helga, Peter Scott, Michael Gibbons. Mode 2 Revisited: The New Production of Knowledge. *Minerva* 41: 179-194.

There is a need for a toolbox/checklist for thinking about innovation systems/systems approach and what methods are available.

There is a need for more reflective learning on what works best to help inform future efforts.

Research needs to be more effective, efficient, and legitimized.

We need to recognize the dynamic aspect of moving back and forth between the application and knowledge continuum.

There is a need for (best) practices for operating in the Pasteur quadrant (use-driven basic research).

The knowledge-action continuum perspective should be dropped and replaced with the "Dynamics of Sustainability Science" framework to change mindsets to identify the "sweet spot."

There is a need for prioritization of use-inspired basic research to demonstrate the usefulness or research to society.

The importance of "dialogues" to understand "process" and capture and share lessons was recognized.

Boundary spanning needs to be integrated with outcome mapping for a results-based management framework.

3.2 Boundary work / Scaling up (replicability of research)

Participants submitted candidate cross-cutting topics for discussion that covered the following:

- Where and how to institutionalize: person, organization, function
- Power asymmetries
- Ethics of how information generated is used
- Effectiveness strategies (e.g., dual accountability, boundary objects)
- Safe spaces/risk taking
- Building trust/ Salience, credibility and legitimacy (relevance, fairness, respect)
- Training boundary workers
- Multiple producers and users
- Tacit/indigenous knowledge
- Outcome mapping – identifying gaps
- Tempering the extremes
- Negotiating?
- Selecting?
- Dependence on what kind of Knowledge
- Negotiation
- Issue cycle; what is a useful boundary object changes through time as the issue matures. Boundary objects also develop and evolve.
- Tools for effective collective action

Discussion focused around the following topics:

"Boundary work" is building the "soft stuff".

"Soft stuff/building trust and confidence": Need to lay the groundwork/develop trust so that multiple audiences will adopt innovation/technology/product later. The influence of the product is significantly affected by the process that generated it.

"Boundary object" is something that the knowledge community and action community have something to say about (e.g., Tryps calendar, Mara wildlife census, RUPES[2] drawing, Reto fence map).

Power asymmetries: Recognize that knowledge can be used as an advocacy tool. If trying to craft knowledge that both sides defer to in a negotiation the facilitator needs to remain neutral, (e.g., RUPES contract for environmental servicees).

Issue cycle: A "useful" boundary object changes through time as the issue matures. Boundary objects also develop and evolve.

Tools for effective collection action (e.g., rules of the game, Constitution).

Scaling-up: Recognize that there will continue to be unmet demand of the development community and large amounts of unused existing knowledge.

4 Next steps

The following topics were suggested as areas that participants would like to pursue.
** Denotes topics that participants agreed to pursue immediately, whilst recognizing that many of these aspects may also feed in (directly or indirectly) to the development of the new unit *Innovation Works* under Patti's leadership.

- ILRI support system for linking K with A
- Wider sharing of group findings
- Development of a framework for systematic study and comparison of on-going projects
- ** Create a Knowledge bank – beginning with material from this workshop being posted together on website
- Capacity building in boundary spanning/negotiation (ILRI/partners)
- Spanner in the works
- Role of Innovation and Learning Unit at ILRI
- Create a way for interaction of community (internal and external to ILRI)
- Develop new projects using approach
- Create a community of practice
- Identify appropriate expertise to draw upon
- Contextualizing vis a vis methods
- How to take out of ILRI - get away from "continuum" concept
- Interaction with universities
- Reconciling language/concepts of different frameworks
- Case studies / stories
- Relate to ILRI partnership review
- Develop prototype checklist
- Quantify impact
- ** Revise workshop memos and turn them into learning briefs that would go into K bank and form core of synthesis brief
    - Revise memos by Dec 15
    - Web posting by Jan 1
    - Comments by Harvard on memos
    - Build community of practice to reconcile language – this is likely to become part of the workshops and other engagements developed by *Innovation Works* in early 2007
- **Include these approaches in new projects
    - West African Tryps (phase 2)
    - Conservation of Livestock in West Africa (GEF supported)

[2] RUPES is an ICRAF led project in Indonesia that has used a number of knowledge to action approaches, including boundary spanners in the context of payment for ecosystem services.

Favorite workshop saying: "Get a spanner in the works"

Readings Bill referred to:

Van Kerkhoff, Lorrae and Louis Lebel. 2006. Linking Knowledge and Action for Sustainable Development. Annual Review of Environment and Resources. 31: 445-477. (website)

David W. Cash, William C. Clark, Frank Alcock, Nancy M. Dickson, Noelle Eckley, David H. Guston, Jill Jäger, and Ronald B. Mitchell. 2003. "Knowledge Systems for Sustainable Development." Proceedings of the National Academy of Sciences 100(14): 8086-8091, http://ksgnotes1.harvard.edu/BCSIA/sust.nsf/pubs/pub81

McNie, E. 2006. Reconciling the supply of scientific information with user demands: An analysis of the problem and review of the literature. *Environmental Science and Policy*. 9. (website)

Clark, William C., and Nancy M. Dickson. 2003. Sustainability Science: The Emerging Research Program. Proceedings of the National Academy of Sciences 100(14): 8059-8061., http://ksgnotes1.harvard.edu/BCSIA/sust.nsf/pubs/pub78

Stokes, Donald E. 1997. Pasteur's Quadrant: Basic Science and Technological Innovation. Washington, DC: Brookings Institution Press. http://brookings.nap.edu/books/0815781776/html/